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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,629	10/09/2001	Jing Cheng	ART-00105.P.1.1-US	6241

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EXAMINER
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LAM, ANN Y

ART UNIT	PAPER NUMBER
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1641

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/973,629

Applicant(s)

CHENG ET AL.

Examiner

Ann Y. Lam

Art Unit

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 19, 20, 22-36 (renumbered 43, 44, 46-60, respectively) is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19, 20, 22-36 (renumbered 43, 44, 46-60, respectively) is/are rejected.
- 7) ☐ Claim(s) 19, 20 and 22-36 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 19-36 been renumbered 43-60 respectively.

### ***Claim Rejections - 35 USC § 112***

Claims 19-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 1-29, it is unclear how a "biochip system" recited in the preamble, can have just one chip.

As to claim 30, it is unclear how one chip can comprises more than one chip.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 19, 20, 22, 24-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Anderson et al., 6,168,948.

As to claim 19, Anderson discloses a biochip system wherein at least one of the chips (col. 15, lines 57-61) is a multiple force chip (i.e., electromagnetic and piezoelectric actuators, col. 21, line 42), wherein the multiple force chip comprises at least one acoustic element (i.e., piezoelectric actuator, col. 21, line 42, or acoustic mixing, col. 32, line 41, or acoustic energy source for lysing cells, col. 42, lines 19-24); further wherein the biochip system can perform two or more sequential tasks, including a processing task (e.g., acoustic mixing, col. 32, line 41.)

As to claim 20, the multiple force chip comprises an electromagnetic element (col. 21, line 42.)

As to claim 22, the chip comprises an electrode (col. 7, line 60.)

As to claim 24, the chip comprises a particle switch layer (i.e., electrode, col. 7, line 60.)

As to claim 25, the chip comprises a chamber (col. 32, line 42.)

As to claims 26 and 27, the sample components can be moved from one area of a chip to another area by traveling wave dielectrophoresis . (Examiner notes that this element refers to an intended use and does not positively claim elements to carry out traveling wave dielectrophoresis or traveling wave magnetophoresis. Thus, the

reference meets the claims if it is capable of performing the intended use. In this case, the components can be moved by traveling wave dielectrophoresis or traveling wave magnetophoresis as well.)

As to claim 28, a sample applied to the biochip system can remain continuously within the system from the beginning of the first sequential task until the end of the last sequential task performed by the system. (Examiner notes that this limitation relates to intended use and that a sample in the biochip is capable of remaining continuously within the system as claimed.)

As to claim 29, the biochip system is automated (see for example, col. 44, line 4.)

2. Claims 19, 22, 24-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Christel et al., 6,368,871.

As to claim 19, Christel discloses a biochip system wherein at least one of the chips (col. 1, line 65) is a multiple force chip (i.e., dielectrophoresis, col. 9, line 13, and piezoelectric ceramic disk, col. 9, line 23, and resistive heater elements, col. 9, line 29), wherein the multiple force chip comprises at least one acoustic element (i.e., piezoelectric ceramic disk, col. 9, line 23); further wherein the biochip system can perform two or more sequential tasks, including a processing task (i.e., moving the nucleic acids, col. 9, lines 11-14, or heating for denaturation or lysis or for polymerase and ligase chain reactions, col. 9, lines 31-34).

As to claim 22, the chip comprises an electrode (col. 9, line 40.).

As to claim 25, the chip comprises a chamber (col. 19, line 17.)

As to claim 28, a sample applied to the biochip system can remain continuously within the system from the beginning of the first sequential task until the end of the last sequential task performed by the system. (Examiner notes that this limitation relates to intended use and that a sample in the biochip is capable of remaining continuously within the system as claimed.)

As to claim 29, the biochip system is automated (col. 4, line 3.)

As to claim 30-31, Christel discloses a biochip system comprising two or more chips (col. 12, line 21), wherein at least one of the chips is a multiple force chip (i.e., dielectrophoresis, col. 9, line 13, and piezoelectric ceramic disk, col. 9, line 23, and resistive heater elements, col. 9, line 29) and further wherein the biochip system can perform two or more sequential tasks, wherein at least one of the sequential tasks is a processing task (i.e., moving the nucleic acids, col. 9, lines 11-14, or heating for denaturation or lysis or for polymerase and ligase chain reactions, col. 9, lines 31-34);

further wherein at least two of the chips can be, for at least a part of the time during the operation of the biochip system, in fluid communication with each other (col. 12, lines 25-27.)

As to claim 32, sample components can be moved from one chip to another by a mechanism other than fluid flow (col. 9, lines 11-13.)

As to claims 26, 27 and 33, the sample components can be moved from one chip to another chip by traveling wave dielectrophoresis or traveling wave magnetophoresis. (Examiner notes that this element refers to an intended use and does not positively

claim elements to carry out traveling wave dielectrophoresis or traveling wave magnetophoresis. Thus, the reference meets the claims if it is capable of performing the intended use. In this case, Christel discloses that the components can be moved by dielectrophoresis (col. 9, lines 13-15), and Examiner asserts that the components can be moved by traveling wave dielectrophoresis and traveling wave magnetophoresis as well.)

As to claim 34, at least one of the chips is a passive chip. (Examiner notes that this limitation refers to an intended use, and the chip is capable of not being actively used.)

As to claim 35, at least two of the chips are active chips (Examiner notes that this limitation refers to an intended use, and the chip is capable of being used.)

As to claims 24 and 36, at least one of the active chips is a particle switch chip. (i.e., the chip has dielectrophoretic elements, col. 9, line 13.)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al., 6,168,948, in view of Parton et al., 5,653,859.

Anderson discloses the invention substantially as claimed (see above.) More specifically, Anderson teaches that particles can be moved using dielectrophoresis (col. 58, lines 21-24.) However, Anderson does not disclose that the dielectrophoresis is specifically traveling wave dielectrophoresis.

Parton discloses that traveling wave dielectrophoresis is well known in the art used to move particles (col. 1, lines 9-13, and col. 6, line 66 – col. 7, line 4.) Traveling wave dielectrophoresis is a type of dielectrophoresis wherein a series of electrodes (i.e., more than 2 electrodes) are used to move particles (col. 6, line 66 – col. 7, line 4.)

It would have been obvious to one of ordinary skill in the art to substitute the traveling wave dielectrophoresis mechanism for the conventional dielectrophoresis in the Anderson chip as a functional equivalent since both perform the same function of using electrodes and an electric field to move particles.

### ***Response to Arguments***

Applicant's responses have been considered but are moot in view of the new ground(s) of rejection. Examiner acknowledges that Applicant had placed the application in condition for allowance based on the previous Office action. However, upon further search and consideration, Examiner believes that the above rejections are appropriate. Examiner apologizes for the inconvenience.

### ***Conclusion***




Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann Y. Lam whose telephone number is 571-272-0822. The examiner can normally be reached on M-Sat 11-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A.L. 

  
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10/12/09